

associated with gall-bladder symptoms, membranous cholecystitis is suggested.

Similarly if in patients with gall bladder involvement, parasites or their ova be found a possible causal connection must be considered.

The examination of the gastric contents after an oliveoil test meal is in some cases of distinct value in differential diagnosis, and it may be that an examination of the bowel movements after an olive oil enema will be found to yield serviceable information.

It is only rarely that even technically good radiograms exhibit shadows of gall-stones. Thus an experimental radiogram technically satisfactory made of a patient who was considered to have a single large stone showed no shadow, though the stone as removed at operation was as large as a hen's egg.

In a small percentage of cases distinct shadows are found on the plate. The position they occupy is of no aid in distinguishing them from the shadows due to renal calculi. The gall-stone shadows commonly exhibit a curious ring effect, an annular denser shadow surrounding a lighter area, this effect being due to the deposit of calcium salts upon the surface of the gall-stone.

Indirectly, however, radiography is of much service in gall-bladder diagnostic work provided it be employed with an intelligent purpose in view rather than in a haphazard manner. Let us suppose that we are palpating a tumor mass which we regard as of either colon or gall-bladder origin. If a marker be placed over the mass, and a bismuth enema be given, and then a radiogram made, a separation of the colon shadow from the area of the marker gives valuable diagnostic information. Or let us suppose pericholecystitic adhesions are suspected. A bismuth test meal is administered, and the stomach radiographed in different postures. If the pyloric portion of the shadow be over in the gall-bladder area and remain there with varying content, we have obtained most helpful corroborative evidence.

In suspected gall-stone ileus I would suggest that the stomach be washed out, and a bismuth meal be administered. It is more than likely that the bismuth would enter the gall-bladder through the duodenal gall-bladder opening, and thus again a radiogram might be of considerable diagnostic service.

The same line of reasoning would suggest a similar procedure in those rare instances in which the gall-bladder seems tympanitic on percussion.

It is not in the province of this paper to deal with operative findings, but I desire to touch on some points over which I have had considerable discussion.

1. The normal gall-bladder can, I believe, be completely emptied by comparatively light pressure during an exploratory laparotomy. If it cannot it should be assumed that there is some hindrance to the outflow. If one ligatures the common bile duct in the dog, one can still completely empty the gall-bladder by comparatively light pressure, the bile filling up the hepatic ducts. It seems

not improbable that the same might be possible in the human with an acutely developing common duct block. Whether with a block of some duration this would be likely to occur is another question, but it would seem wise for the surgeon in his gall-bladder work to see the course the bile takes when he squeezes the gall vesicle. I desire to emphasize the words "light pressure," since with a block at Vater's papilla it is possible that bile could be forced into the pancreatic ducts.

2. The outside of an organ is no real clue as to what is within. In the case of gall-bladder infection simulating malignant endocarditis that I have already alluded to, the gall-bladder was not enlarged, its outside seemed healthy to the surgeon, to Dr. Jellinek and myself, yet a drop of bile drawn off through a hypodermic syringe and examined microscopically was seen to teem with organisms, and the drainage of this healthy looking gall-bladder cured the patient.

3. In the angle between the body and neck of the gall-bladder is a lymphatic gland which when indurated feels not unlike a calculus. In cholecystitis the lymph glands up and down the common duct are found to be enlarged. Lymphatic gland enlargement then must not in doubtful cases be interpreted to mean a malignant condition.

SURGICAL TREATMENT OF GALL-BLADDER DISEASE.*

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One need not look far back in medical literature to learn that gall-bladder operations were infrequent almost up to the beginning of this century. The foundation work laid by Courvoisier, Kocher, Langenbuch, Bobbs, Sims, Riedel, McBurney and others attracted more or less attention, but the realization of the importance of gall-bladder surgery came from the publication by Kehr of Halberstadt of some four hundred operations on the gall-bladder and bile ducts. Later Mayo Robson and the Mayos reported large numbers of operations and the various manipulative procedures were put on a firm basis.

The points I desire to bring up for discussion in this paper are: First, the advisability or necessity of operations on the gall-bladder; second, some of the technical procedures to be employed.

It was long held by many medical practitioners that operations on the gall-bladder were only justified in the presence of serious complications, such as acute cholecystitis, profound jaundice, perforation or gangrene of the gall-bladder. This opinion was largely based on the fact that the mortality of gall-bladder operations was high, even in the simple cases; and also on postmortem statistics, which showed that in approximately 10 per cent. of the cases gall-stones existed and that symptoms due to them were apparently lacking during life. I use the word "apparently" because I believe that in the vast majority of such cases, symptoms which were either overlooked or ascribed to other condi-

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tions, did exist during life. Think of the large number of cases of so-called dyspepsia, indigestion, cramps, catarrh of the liver or stomach which have been shown to be dependent upon gall-stone disease. In certain respects the history of gall-bladder disease parallels that of disease of the vermiform appendix—the recognition of the part played by the appendix in the production of symptoms referable to the gastro-intestinal tract was long delayed; so too with the gall-bladder—the operative measures for approaching and dealing with the appendix and gall-bladder have been gradually evolved and often at the cost of lives; and finally the importance of early diagnosis and early operation in these cases has been painfully learned at the operating table or in the postmortem room. Before the pioneer work of Fitz and McBurney on appendicitis was published, it was the rule to wait for an abscess to form before surgical intervention was deemed justifiable—to-day many cases of gall-bladder disease are not treated surgically until serious complications are present. There can be no gainsaying the fact that many individuals go through life with a chronic inflammation of the appendix or some chronic affection of the gall-bladder. The patient with the diseased appendix is, however, usually advised by his physician to have it removed—the patient with the diseased gall-bladder is often counseled by his medical adviser to let it alone. I believe that the day is not far distant when physicians and surgeons will look upon acute and chronic disease of the gall-bladder as they now look upon appendicular disease and in the vast majority of cases urge early surgical treatment. The surgical treatment of gall-bladder diseases in an early stage is not technically difficult and the results are good. Practically speaking, these early cases include only gall-stones in the gall-bladder and cholecystitis, but the late stages and the complications include gangrene, perforation, hydrops, empyema and carcinoma of the gall-bladder, obstruction of the cystic and other bile ducts, pancreatitis and adhesions. The treatment of many of these late conditions is far from satisfactory and the ingenuity and resources of the surgeon are often taxed to the utmost.

It seems reasonable to suppose that disease of the gall-bladder will be less prevalent in the future than in the past, for with the practical stamping out of typhoid fever, the early removal of diseased appendices, the prevention of many postpartum infections by modern obstetric methods and the general improvement in individual sanitation, many of the causes of gall-bladder disease will be eliminated.

The methods of approach to the gall-bladder are limited to a few types of incision which are more or less classical. The object to be attained is the freest exposure of the gall-bladder and surrounding structures, with the least permanent damage to the abdominal wall. In those cases of cholecystitis which only require drainage a short vertical or oblique incision is all that is necessary. A similar incision can also be applied to those cases of gall-stones in the gall-bladder which are discovered in

the course of other abdominal operations and where palpation reveals no complications. The Kocher incision, parallel to the margin of the ribs and through the right rectus muscle, gives a good exposure, but it is often difficult to avoid injury to the lower intercostal nerves which supply the upper part of the rectus muscle. An incision through the outer portion of the right rectus, with extensions if necessary after the manner described by Mayo Robson and Bevan, is my personal choice, as it permits removal of the appendix which is often concomitantly diseased. In individuals with thick, fat abdominal walls, access to the deeper structures is difficult and the incisions are necessarily longer than with thin persons. The elevation of the back, at the level of the liver, by means of a sandbag or suitable table appliance, is often of great value, as it throws the liver upwards and forwards. By downward traction and slight rotation of the liver, part of the right lobe can often be brought out of the wound and the gall-bladder and ducts rendered easily accessible. One should not forget to lower the patient to a level or slightly flexed position before closing the wound.

Adhesions are often present. Whether they should be removed or not should depend upon the individual case—they may serve a useful purpose in limiting infection, as in acute cholecystitis or abscess, or they may be the cause of symptoms. Patient dissection is often necessary—rough handling is to be deplored.

In many acute affections of the gall-bladder with the patient in serious condition, the indication is to merely open it and drain—the desire to remove all the pathological conditions in one operation should not make us lose sight of the patient's recovery. One should not be ashamed to do some of these operations in two or more stages, and the test of the good surgeon is not the brilliant operation he does, but the underlying regard for the welfare of the patient which he has. Where conditions permit, a thorough palpation of the cystic, hepatic and common ducts, the pancreas and the appendix should be made before opening or removing the gall-bladder.

The question of cholecystostomy or cholecystectomy is one that is sure to arise in the mind of the surgeon during many operations on the gall-bladder, but there are a few general principles which should guide one in arriving at a conclusion. If there is obstruction of the common duct and the cystic duct is patent, the gall-bladder should not be removed—it may later be needed for a cholecystenterostomy. In the presence of pancreatitis it is also well to keep the gall-bladder for drainage. One of the most important things to do in gall-bladder work is to institute drainage of the biliary tract, for infection is the etiologic factor in nearly all the diseases of the gall-bladder, and drainage from the gall-bladder is more efficient and safer than drainage from the cystic duct. A non-functioning gall-bladder should if possible be removed, for it is occasionally the seat of a beginning cancer or apt to give rise to a mucous fistula. A thickened gall-bladder or one in which the walls

have been eroded by gall-stones is also better out than in, for similar reasons. It not infrequently happens, however, that a cystic duct which seems entirely closed will open up after drainage of the gall-bladder through the subsidence of inflammatory swelling. When the gall-bladder is of normal thickness and the ducts clear, it is in my judgment better to save it. The risk of cancer developing in such a gall-bladder is certainly small, while the risk of a later obstruction of the common duct from an overlooked or new-formed stone or from cicatricial contraction is probably much greater. Cancer or other tumors of the gall-bladder if found before hopeless involvement of neighboring structures, of course call for radical excision. In the Mayos' statistics of 1800 operations of the gall-bladder or ducts, cancer was present in 4 per cent. and most of them were hopeless cases. Where a cholecystectomy is indicated for benign conditions and the presence of adhesions would render it a difficult or dangerous operation, it is well to remember that excision of the mucous membrane down to the cystic duct, as first advocated by W. J. Mayo, will effect the same result and be found easier of performance. This method also offers a safer means of drainage than a complete cholecystectomy.

Drainage through a stab wound in the loin to one side of the original incision is often advisable and occasionally permits complete closure of the larger wound. In draining the gall-bladder one should endeavor to bring the tube out in such a position that the fundus of the gall-bladder will ultimately be high up, in order to assist natural drainage while the patient is erect.

The mortality of uncomplicated cholecystostomy does not exceed 1 per cent. in skilled hands, while in cholecystectomy it is slightly higher. Undoubtedly with further technical improvements and greater familiarity with the surgery of the gall-bladder, the mortality rate will be lowered.

THE SYMPTOMATOLOGY OF GALL-BLADDER DISEASE.*

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In 1905 I had the pleasure of reading a paper before this Society upon the clinical features of gall-bladder and gall-duct disease. The mass of publication since that time has brought a few new facts and points of view, but no one feature has been as frequently emphasized through many papers as the importance of a careful history of the patient in establishing an early diagnosis of these affections.

Certain general considerations may properly introduce the subject of to-day. Disease of the gall-bladder is common. In the great majority of cases it is due to infection; stones are nearly always the result of a low-grade infection; many of the clinical

features are dependent upon recurrent infection. Acute cholecystitis may accompany or follow infections like pneumonia, influenza, tonsillitis. A history of *typhoid* should be given due weight in the interpretation of indefinite digestive disturbances or abdominal pain. Gall-bladder symptoms may occur during the typhoid or soon after, though more commonly there is a latent period of some months or years. A man seen two years ago was positive that dyspepsia followed directly typhoid fever 35 years before. For years there were indefinite stomach symptoms before a typical colic called attention to the gall-bladder. When seen he had dilatation of the stomach with hypochlorhydria due to adhesions of the gall-bladder to the duodenum. In a young woman of 20 seen recently attacks of indigestion with marked distress in the upper abdomen had recurred during the past three years. There had been a severe typhoid infection at the age of 15. Operation showed stones in the gall-bladder without adhesions.

Certain associations of cholecystitis should be born in mind.

1. *Appendicitis*.—Ochsner, Moynihan, Dieulafoy, W. H. Mayo, Sherren have emphasized the frequent coincidence of disease of the gall-bladder and appendix. Dieulafoy would have the involvement of the appendix follow primary gall-bladder infection and I have seen two cases which were much like his excellent descriptions of an acute appendicitis following a few days after an acute suppurative cholecystitis. Usually the sequence is the other way and gall-bladder symptoms follow repeated attacks of appendicitis. There can be no longer any doubt that infection of the appendix—even when chronic and of a low grade—is a very frequent cause of other abdominal disease, of colon adhesions, of cholecystitis, and of ulcer of the stomach and duodenum.

It is interesting in the histories of patients to trace the variations of symptoms dependent upon the development of new foci of abdominal infection. In a man of 50 operated upon recently in hospital, attacks of abdominal pain with vomiting recurred throughout boyhood. We know that the recurrent stomachaches of children most often mean appendix disease though they may occur also as associates of acidosis or migraine. After typhoid at 30 more severe attacks of abdominal pain recurred once or twice a year and were accompanied by chills and fever for several days. Gradually during recent years there developed symptoms of stomach dilatation and retention and the usual signs of this condition were found on examination—operation showed a large gall-bladder enclosing stones and adherent to the liver and duodenum and so kinking and narrowing the duodenum as to cause great dilatation of the stomach. A man 55 seen

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